National Coastal Condition Assessment

NWQMC 2016

Hugh Sullivan, EPA, OWOW

Presentation Outline

- NCCA 2010 Overview
- Key Findings
  - Biological Condition
  - Sediment Quality
  - Water Quality
  - Ecological Fish Tissue Quality
  - Highlight: Gulf of Mexico Sediment Toxicity
- Who is using Coastal Data?
- What's next for the NCCA?


National Coastal Condition Assessment
Assessing the Nation's Waters
NCCA 2010 Overview

The NCCA is a Part of the NARS Program


Coastal


Streams and Rivers

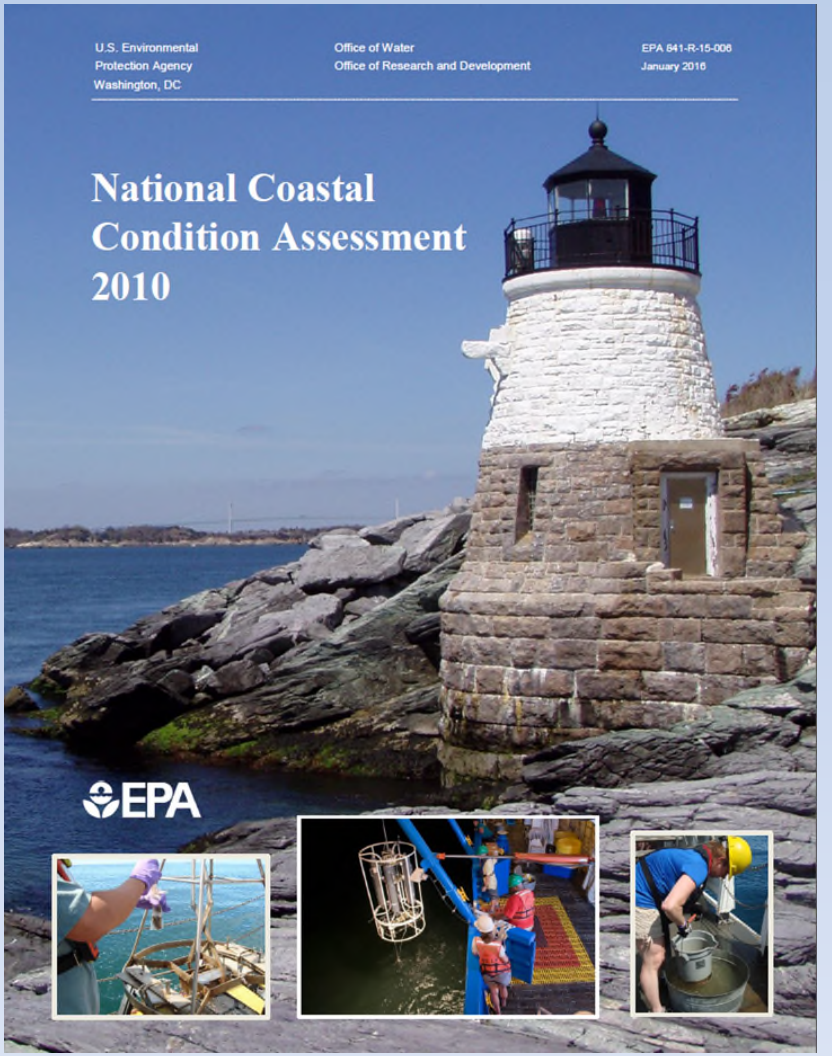

Wetlands


Lakes

- National Aquatic Resource Surveys are a series of surveys implemented by EPA and our state and tribal partners addressing four waterbody types.
- Uses statistically valid random surveys to answer a set of questions about all surface waters within the 48 conterminous states
  - What is the condition of the nation's waters?
  - Is the condition of the nation's waters getting better or worse?
  - What is the extent of stressors affecting the nation's waters?
- Cost effective, nationally consistent, regionally relevant means of tracking status and trends
- Builds from almost 20 years of research and pilots

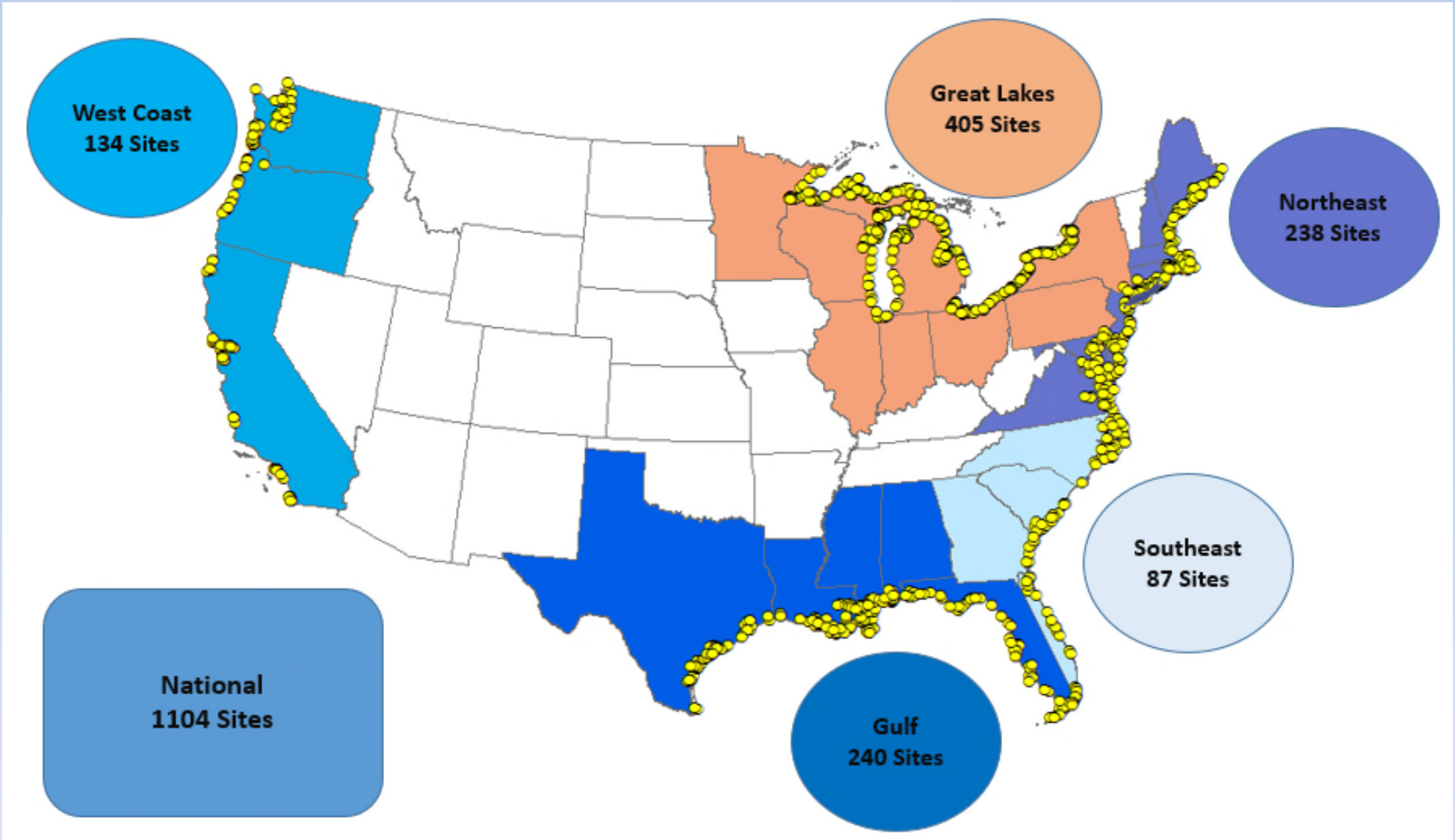
The NCCA 2010 is the Fifth Coastal Condition Report

- The 2010 survey transitioned the NCCA from research to monitoring.
  - Aligned with other NARS reports
  - 1st statistically valid randomized survey of the Great Lakes nearshore and embayment waters.



Locations of NCCA 2010 Sampling Sites

- 1,104 sites represent 35,400 square miles of coastal waters.

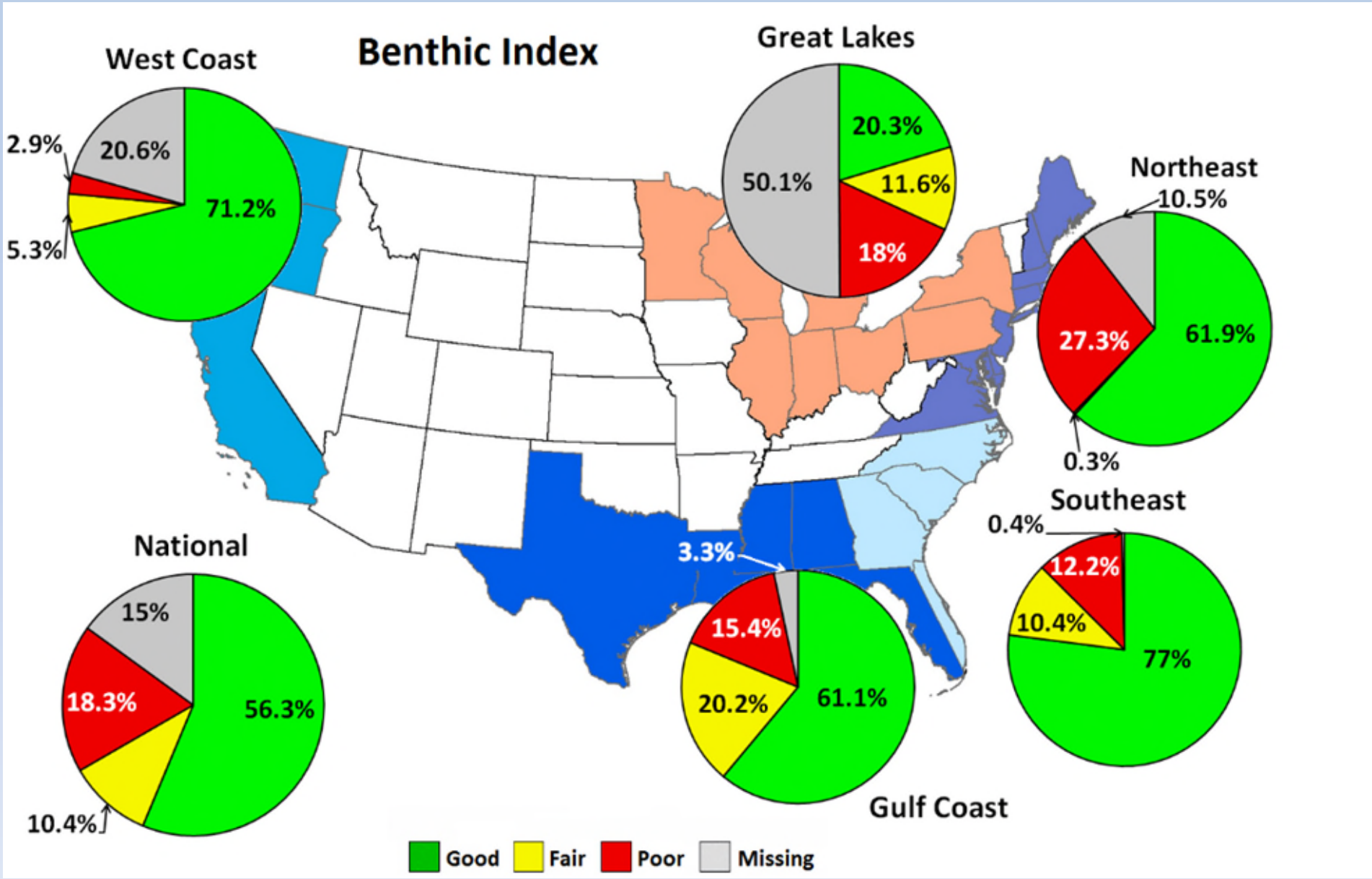


The NCCA 2010 Report Assesses

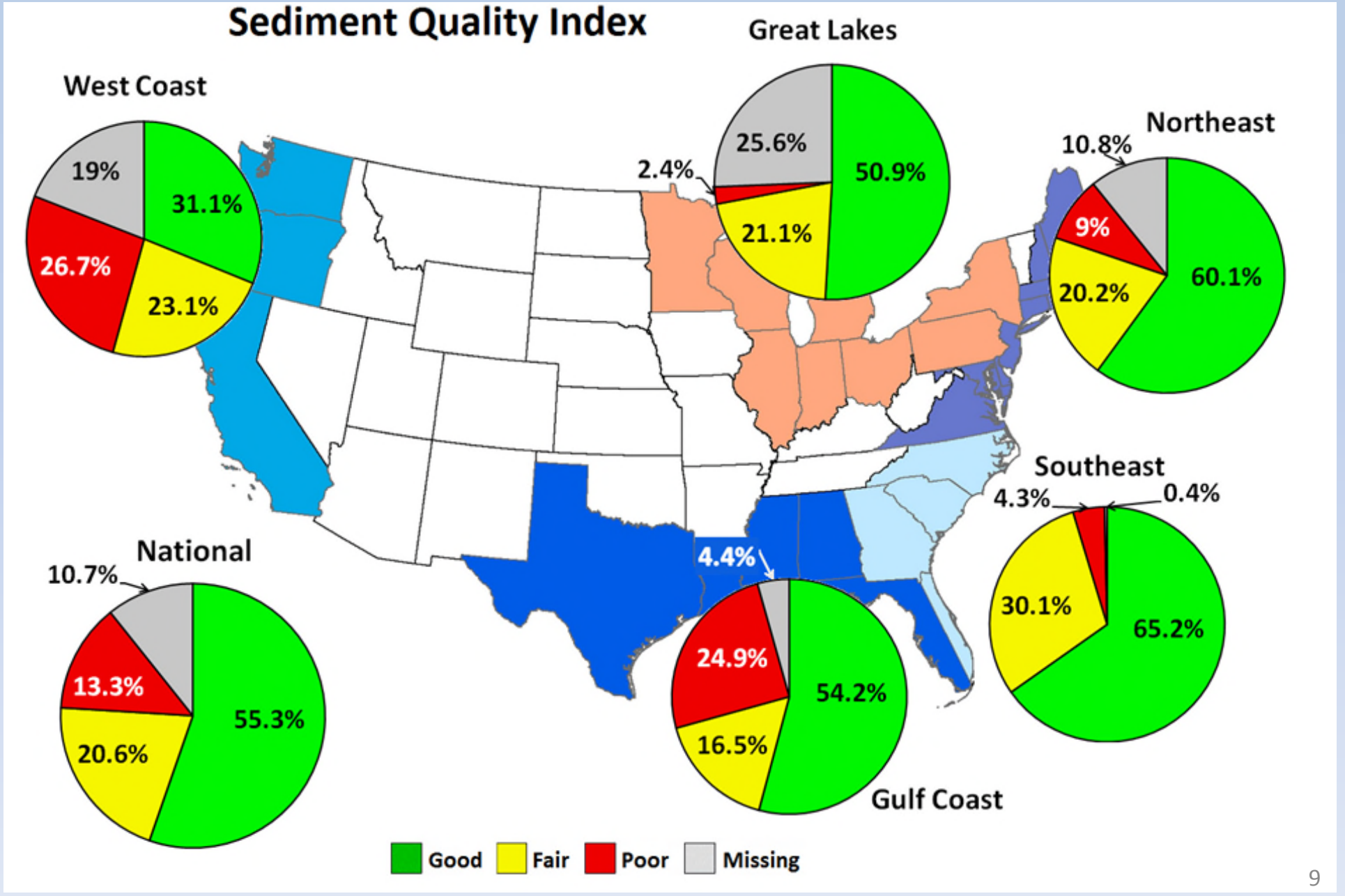
- **Biological Quality**
  - Benthic Macroinvertebrate
    - Community diversity
    - Pollution tolerance
- **Sediment Quality**
  - Sediment Chemistry
  - Sediment Toxicity
- **Water Quality**
  - Nutrients
    - Phosphorus
    - Nitrogen
  - Chlorophyll *a*
  - Dissolved Oxygen
  - Water Clarity
- **Ecological Fish Tissue Quality**
- **Change in condition for long-term indicators**

- **Highlights include:**
  - Watershed influence on Great Lakes Waters
  - Potential Utility of Video Sampling
  - Great Lakes Human Health Fish Tissue Study
  - NOAA Gulf of Mexico Offshore Surveys
  - The Gulf of Mexico Oil Spill: *Sediment Findings from NCCA 2010*
  - Monitoring in Alaska's Northeastern Chukchi Sea

NCCA 2010 Biological Condition



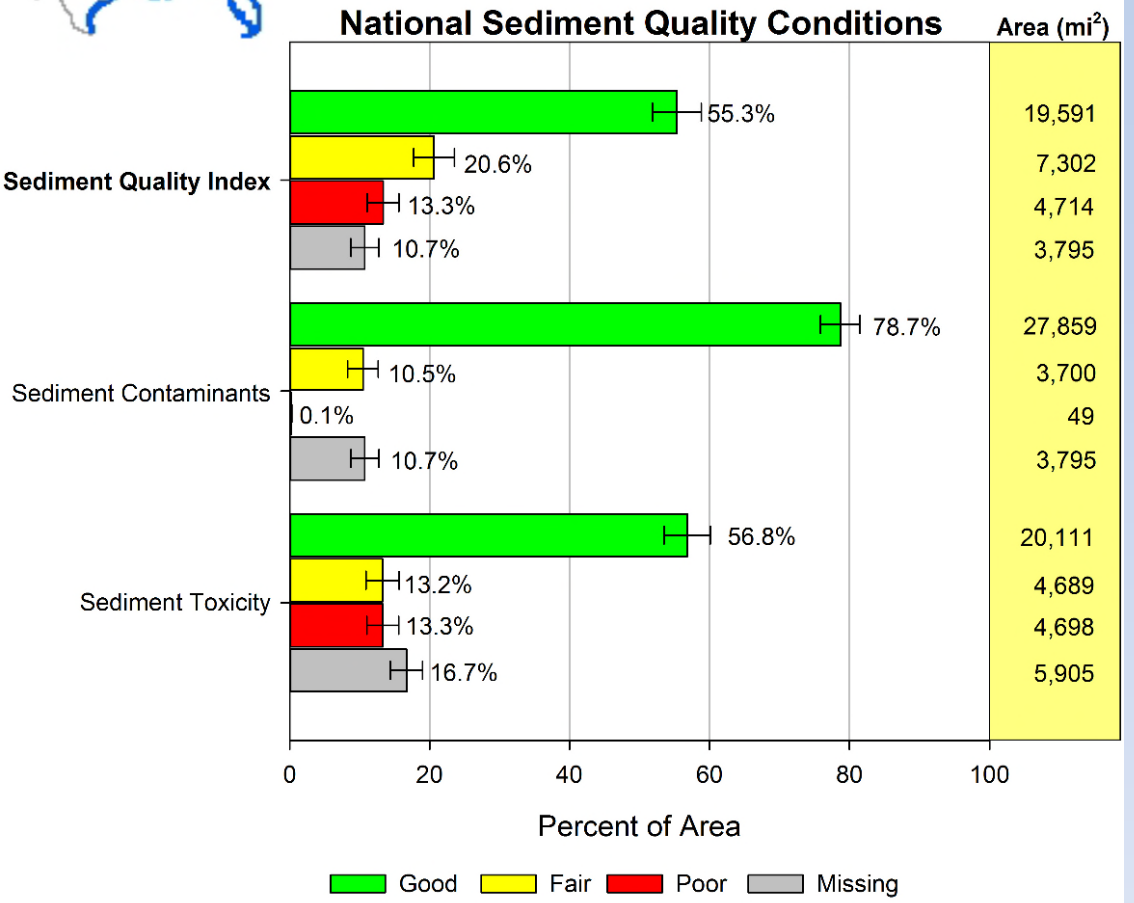
NCCA 2010 Sediment Quality



Sediment Toxicity is More Widespread than Contaminants

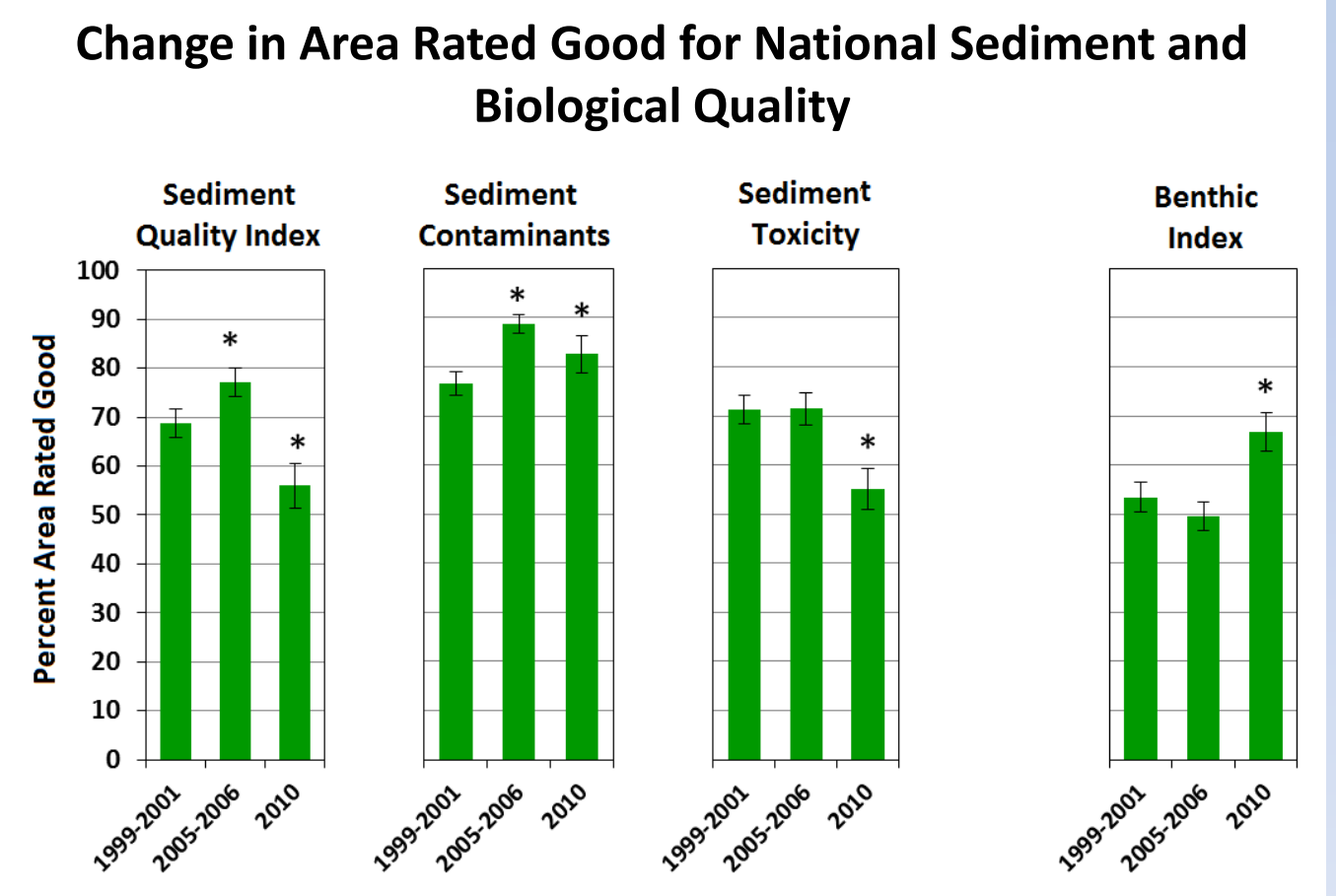
55% of U.S. coastal and Great Lakes nearshore waters have good sediment quality.

Areas rated good decreased by 22% between 2005-06 and 2010.



Change in Sediment and Biological Quality

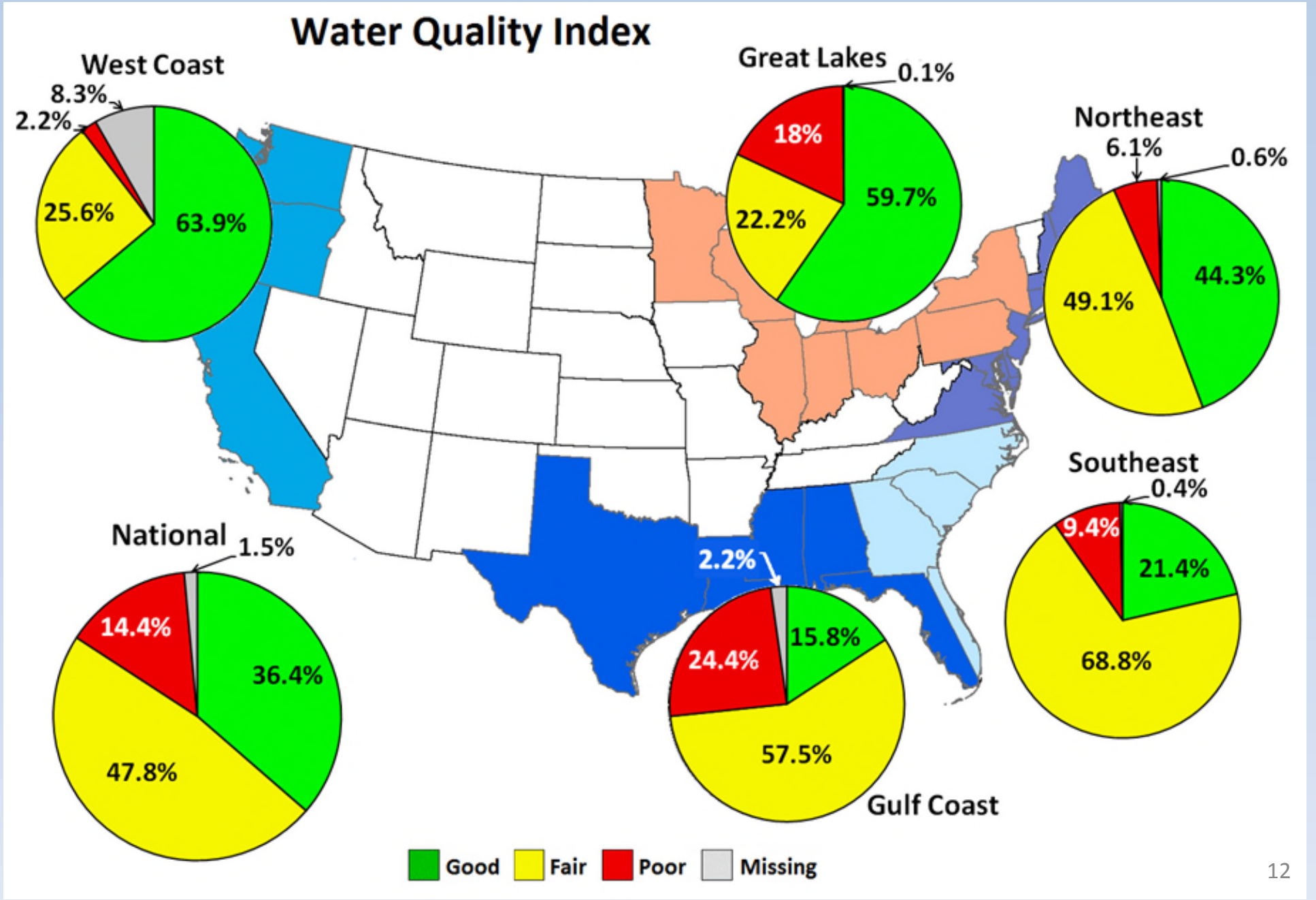
The **Takeaway**: Sediment quality has worsened over time. Area rated good for both of the sediment indicators declined significantly in 2010. In contrast, the benthic index improved significantly across the country.



* Indicates significant change from previous survey.

Percent area rated good for sediment quality, its components, and biological quality

NCCA 2010 Water Quality

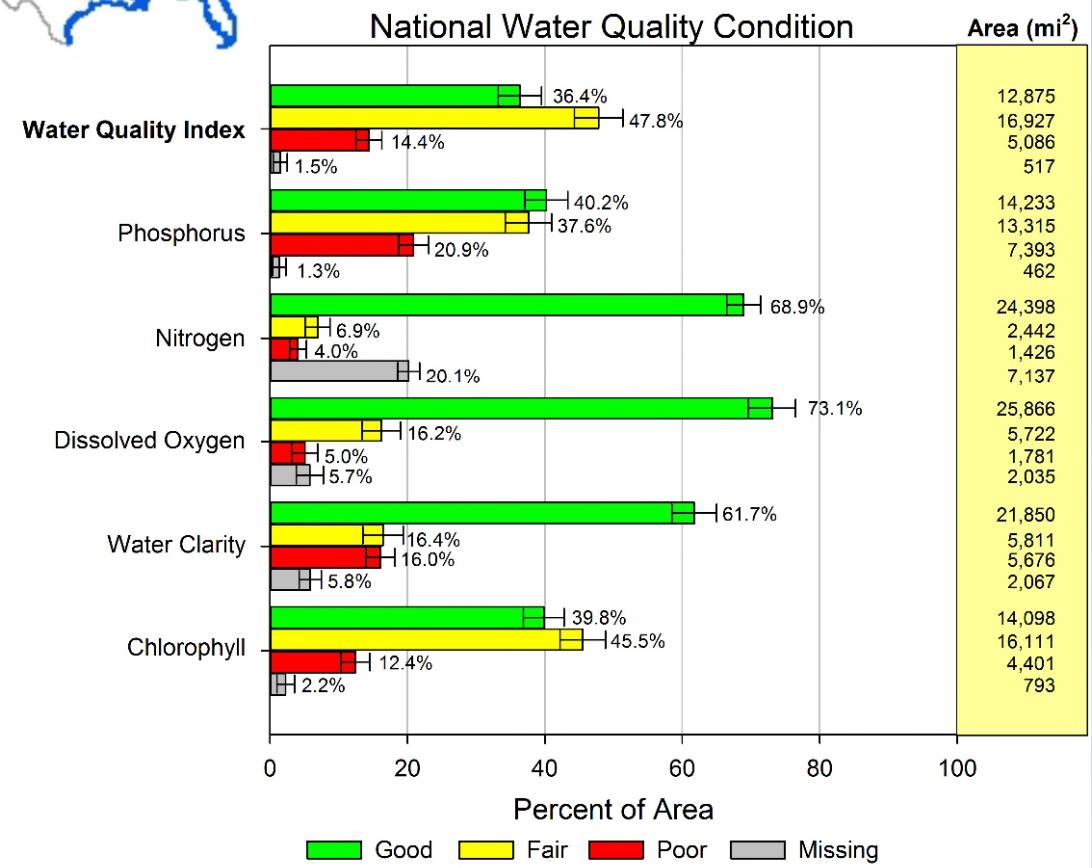


Phosphorus and Chlorophyll Contribute the Most to Reducing the Water Quality Rating.

36% of U.S. coastal and Great Lakes nearshore waters have good water quality.

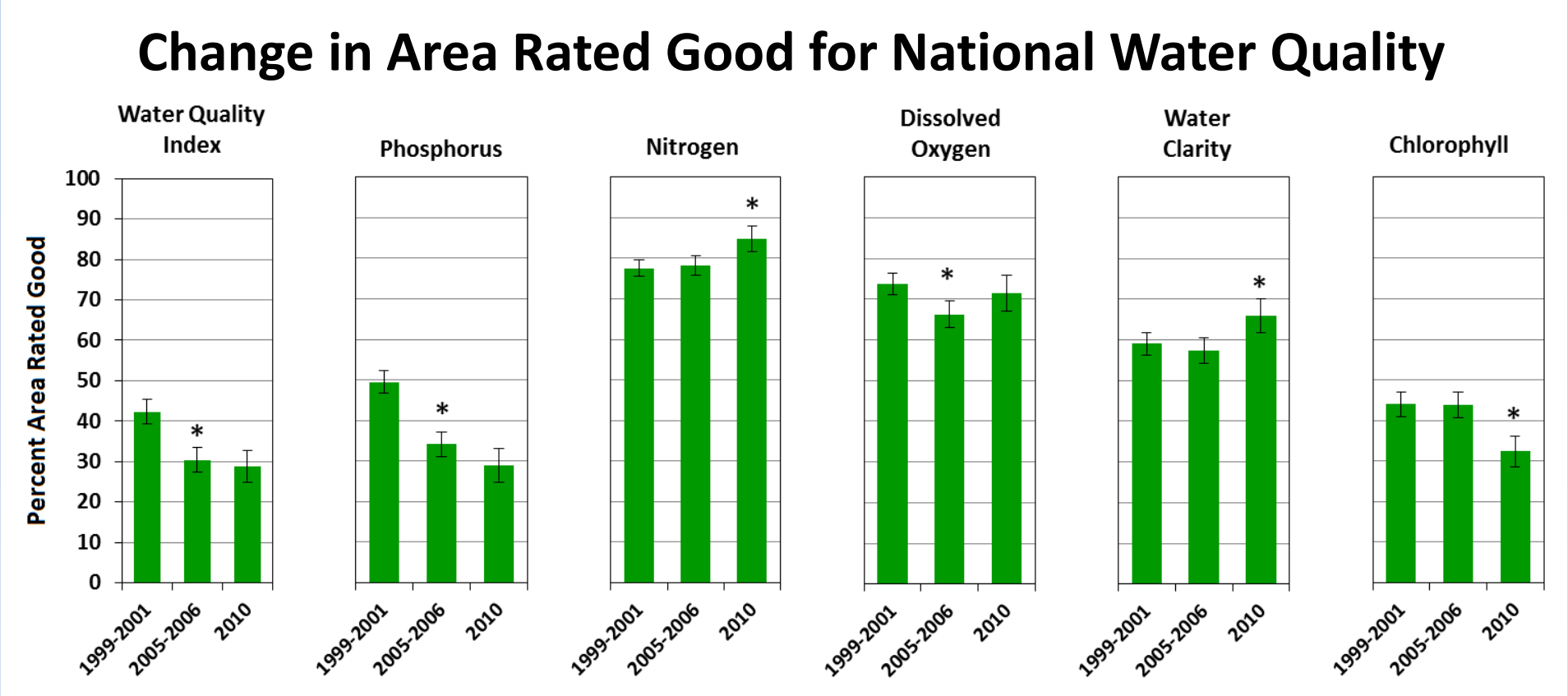
Phosphorus is the leading indicator contributing to poor condition in coastal waters.

This is not a significant change in percent area rated good for overall water quality since the 2005-06 survey.



Change in Coastal Water Quality

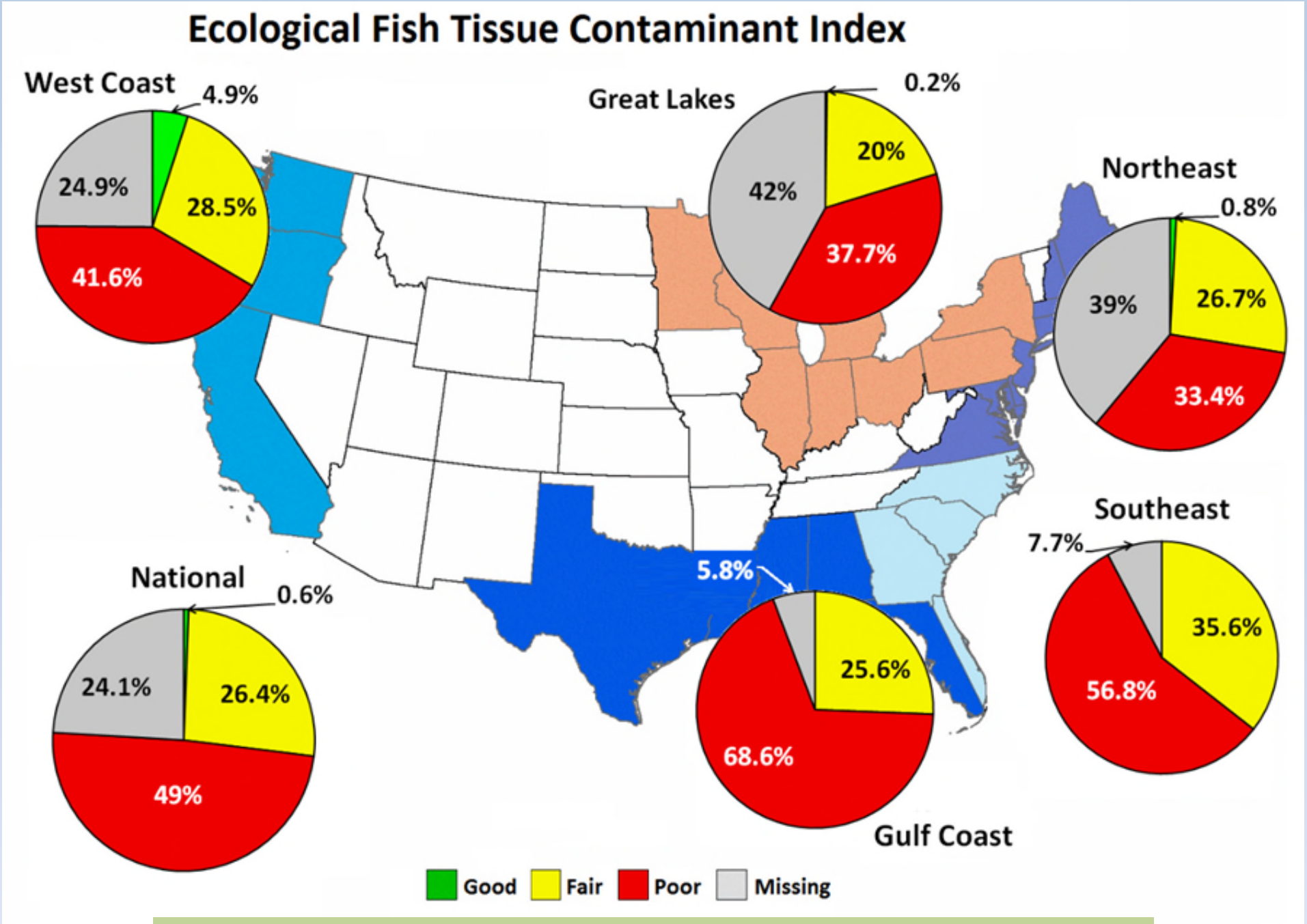
The **Takeaway**: While in 2010 there is no significant change in water quality from the previous period, water quality has worsened over the last decade, as indicated by the decrease in area rated good.



Percent area rated good for the water quality index and its component indicators

* Indicates significant change from previous survey.

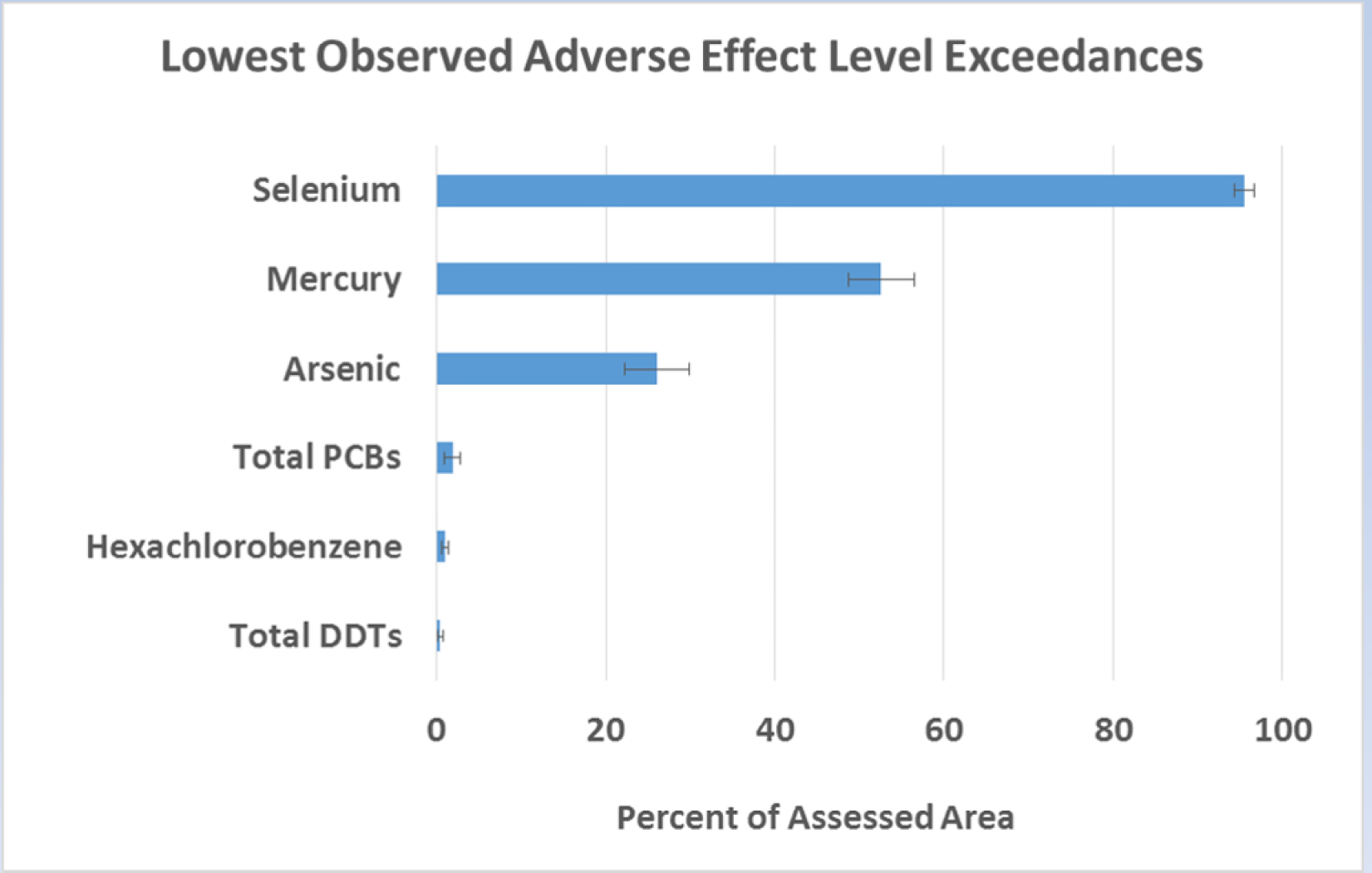
NCCA 2010 Ecological Fish Tissue Quality



This index is used to assess potential harm to wildlife, not people.

Selenium is the Most Widespread Ecological Fish Tissue Contaminant.

The **Takeaway**: These contaminants have potential to accumulate in the food chain, leading to negative effects for predators of contaminated fish.



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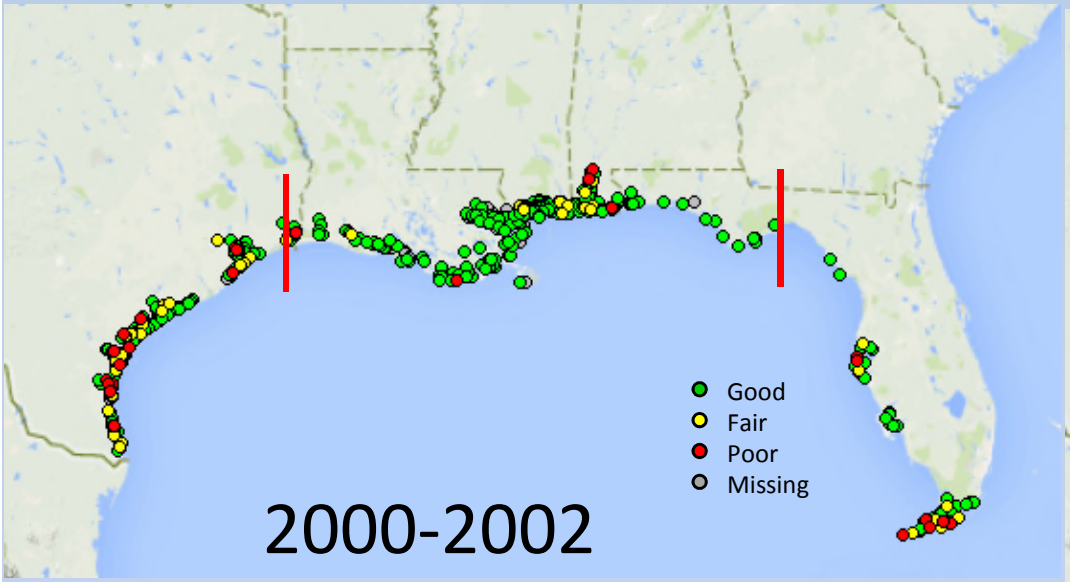
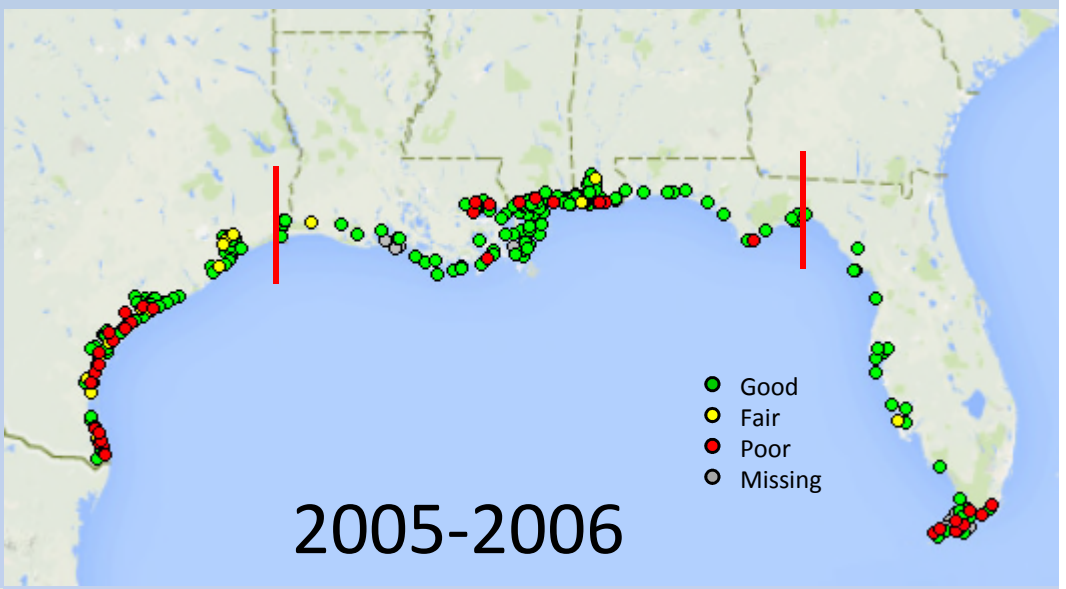
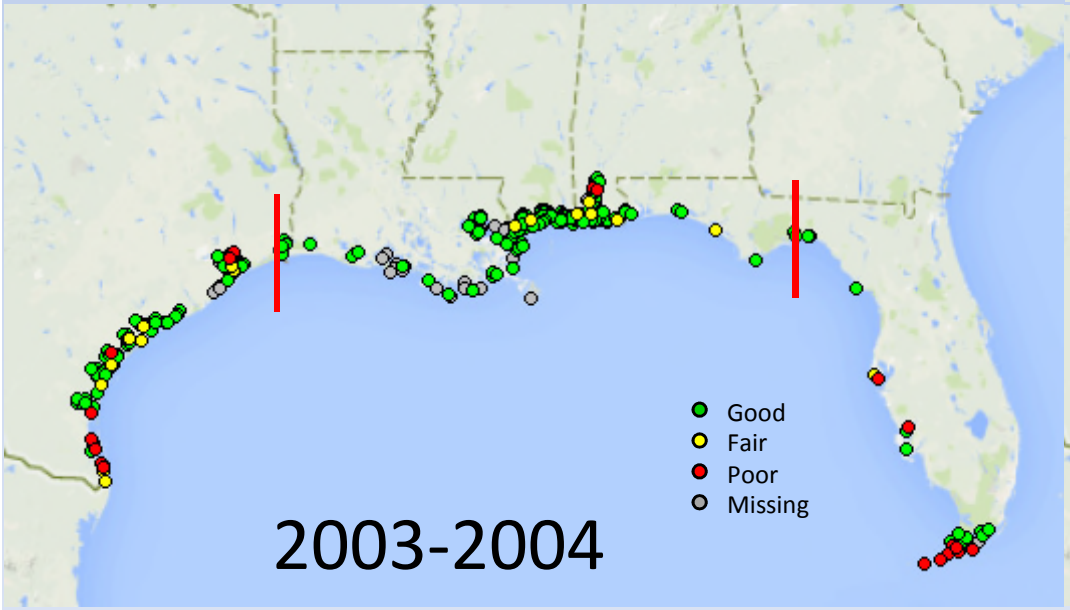
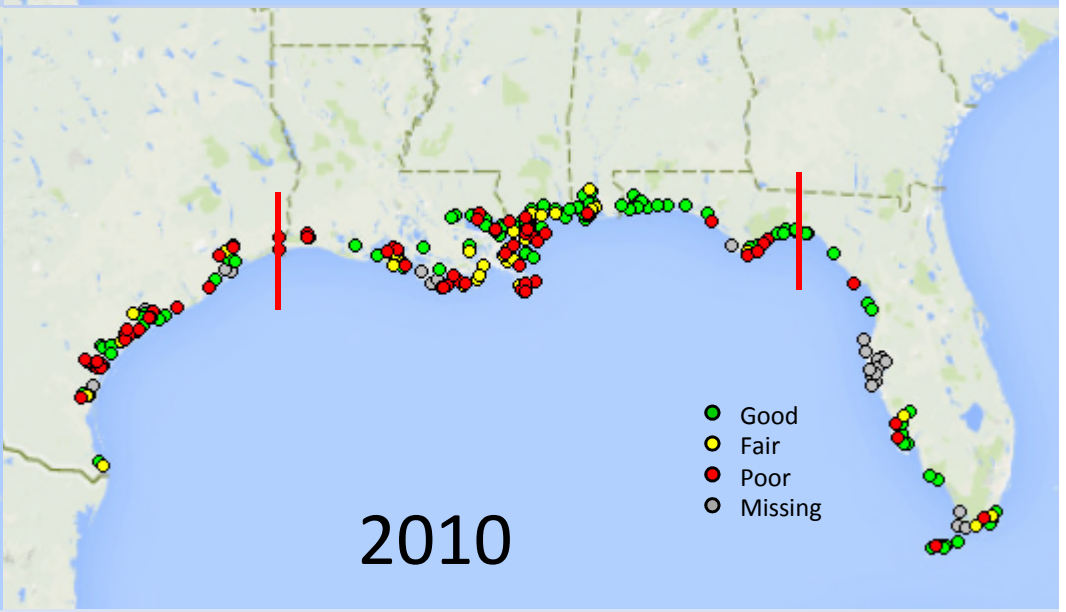
Highlight: Sediment Toxicity in the Gulf of Mexico



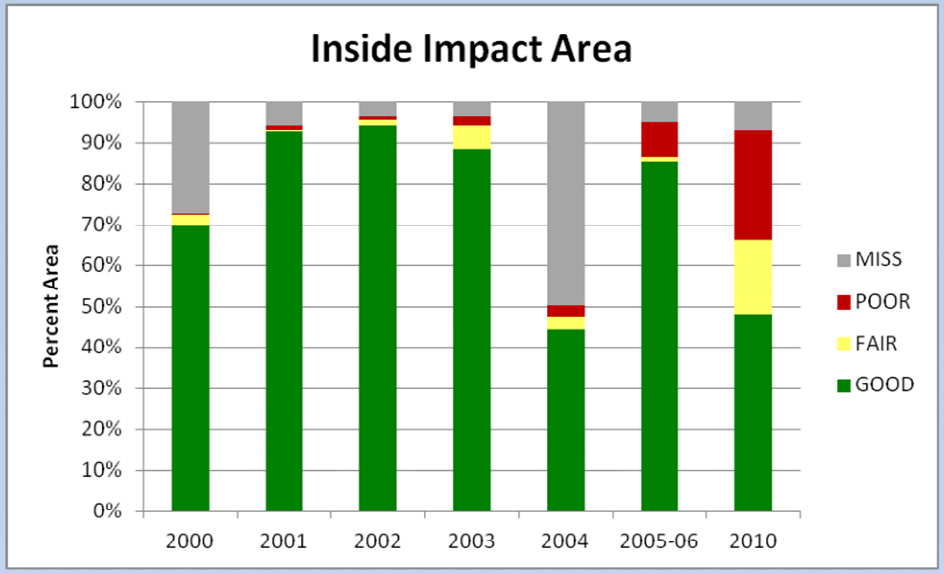


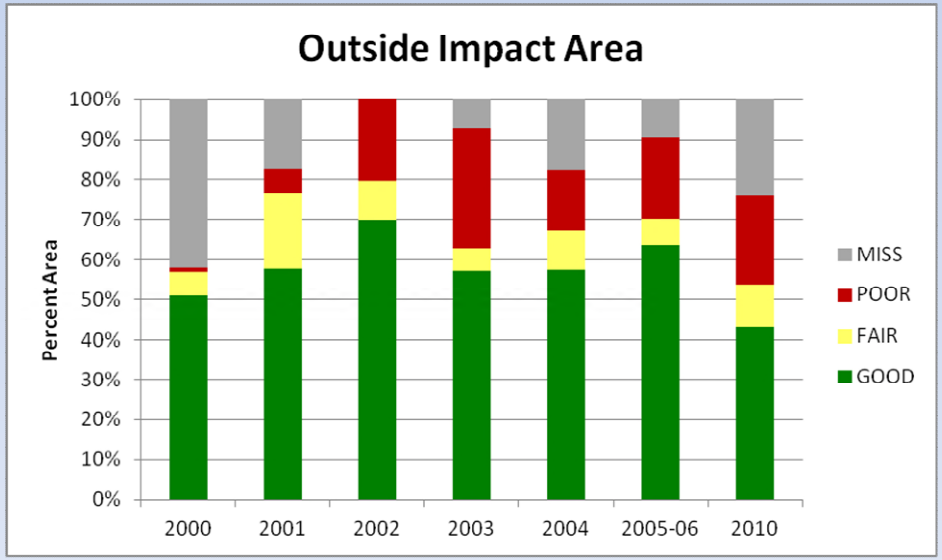




Highlight: Sediment Toxicity in the Gulf of Mexico

- NCCA 2010 found that sediment toxicity in the Deepwater Horizon oil spill impact area was worse than previous survey results in that area.
- These findings do not establish a cause and effect relationship between the DWH oil spill and increased sediment toxicity, but demonstrate an association between the spill and sediment toxicity.





So who is Using NCCA Data?

National Park Service

- Hobbs, W. O., B. M. Lafrancois, and E. DiDonato. 2016. Nearshore conditions in the Great Lakes national parks: A baseline water quality and toxicological assessment. Park Science 32(2):36-45. Available at http://www.nature.nps.gov/ParkScience/archive/PDF/Article_PDFs/ParkScience32(2)Winter2015-2016_36-45_Hobbs_et_al_3834.pdf.

EPA Partners and Collaborators

- Gillett, D.J., S.B. Weisberg, T. Grayson, et al. 2015. Effect of ecological group classification schemes on performance of the AMBI benthic index in US coastal waters. Ecological Indicators 50 (2015), pp. 99-107.

EPA Regional Offices, Program Offices and Laboratories

- Kelly, John R.; Yurista, Peder; Starry, Matthew; Scharold, Jill; Bartsch, Will; Cotter, Anne. 2015. Exploration of spatial variability in nearshore water quality using the first Great Lakes National Coastal Condition Assessment survey. J. Great Lakes Res. 41(4), 1060-1074.
- Lietz, Julie E.; Kelly, John R.; Scharold, Jill V.; Yurista, Peder M. Can a Rapid Underwater Video Approach Enhance the Benthic Assessment Capability of the National Coastal Condition Assessment in the Great Lakes? Environmental Management (2015). 55:1446-1456.
- Scharold, J.V., Corry, T.D., Yurista, P.M., Kelly, J.R., 2015. Benthic macroinvertebrate assemblages in the nearshore zone of Lake Erie, 2009: status and linkages to landscape-derived stressors. J. Great Lakes Res. 41(2), 338-347.
- Nord, Mari; Hinchey, Elizabeth; Bolks, Andrea; Bartsch, Will, 2016. Great Lakes Technical Memorandum: 2010 National Coastal Condition Assessment. USEPA, Region 5 and Great Lakes National Program Office. 62 Pages.

State Partners

- R.F. Van Dolah, D.M. Sanger, G.H.M. Riekerk, S.E. Crowe, M.V. Levisen, D.C. Bergquist, D.E. Chestnut, W. McDermott, M.H. Fulton, E. Wirth. 2013. The Condition of South Carolina's Estuarine and Coastal Habitats During 2009-2010: Technical Report. Charleston, SC: South Carolina Marine Resources Division. Technical Report No. 107. 64 p.
- Commonwealth of Virginia Draft 2014 305(b)/303(d) Water Quality Assessment Integrated Report. http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/2014305(b)303(d)IntegratedReport.aspx

What's Next for the NCCA?

- **Greater than 90% of 2015 sample processing is complete. QC has begun.**
  - **Indicator Work Groups**
    - **Water Quality**
      - **Reviewing thresholds, guidelines and reporting**
    - **Benthic Macroinvertebrates**
      - **Validating M-AMBI; hopefully ready for use in 2015.**
      - **Investigating potential Great Lakes benthic index.**
    - **Ecological Fish Tissue Contaminants**
    - **Sediment Quality**

What's Next for the NCCA?

- New indicators in 2015 include:
  - Algal toxins
    - Microcystins – will be compared to established thresholds
    - Additional Algal toxins are a research indicator
  - Mercury in fish fillets for human health
    - Fish plug analysis to compare mercury concentrations to established thresholds
  - Types and extent of land-based trash
    - Working with EPA's Trash Free Waters program to characterize type and extent of land-based trash

Conclusion

- The NCCA 2010 results support the need for continued attention to coastal stressors at the national, regional, state and watershed scales.
  - Nutrient Management:
    - Support implementation of state nutrient management strategies
    - Support farmers' efforts to manage nutrient on farmlands and feedlots
    - Support efforts to improve nutrient removal in wastewater treatment
    - Encourage streamside buffers to reduce nutrients and prevent flushing downstream
  - Fish Tissue Contamination:
    - Selenium: Updated freshwater criteria may reduce downstream concentrations.
    - Mercury: 2011 Mercury and Air Toxics Standards reduces power plant emissions; further reductions expected from the Clean Power Plan and Steam Electric Rule.
  - Sediment Toxicity and Contamination:
    - Manage legacy contaminants and prevent new releases from pipelines, navigation and spills
    - TMDLs have led to reduction in contaminant concentrations.
      - Example: Reduction in PCBs after TMDL in Delaware Bay

Contact Information

Hugh Sullivan
Acting National Coastal Condition Assessment Project Lead,
Monitoring Branch, U.S. EPA
Office Wetlands, Oceans, and Watersheds
Sullivan.Hugh@epa.gov

http://www.epa.gov/national-aquatic-resource-surveys/ncca